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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/565,768

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EXAMINER

STEVENS, GERALD D

ART UNIT

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2817

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/565,768	Applicant(s) TAMURA ET AL.	
	Examiner GERALD STEVENS	Art Unit 2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/24/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-11 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 1 recites the limitation "*wherein when the filter and the antenna switch circuit are directly connected with each other at a connection point*" in pg. 18 lines 12-13. There is insufficient support in the disclosure for this limitation in the claim.

According to the specification there is always an adjustment line, which is part of a coupler, connected between the filter and the switch circuit. Also, this limitation of claim 1 noted above contradicts with the limitation "*an adjustment line connected between the filter and the antenna switch circuit*" found on page 18 lines 8-9.

Due to the vague and indefinite nature of the limitation listed above with respect to claim 1 examiner will not give the limitation "*wherein when the filter and the antenna switch circuit are directly connected with each other at a connection point*" any patentable weight during the examination of the present application.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ishizaki et al (US 20030076195) in view of Yamazaki et al (US 20020113666).

Regarding claim 1, Ishizaki teaches a filter (fig. 7 filter 8b) passing fundamental frequencies and having an attenuation pole (pg. 1 par. 0014);

an antenna switch circuit (fig. 7 antenna switch 4) switching antennas which match the fundamental frequencies (wherein it is inherent in the function of the diversity antenna module to switch the antenna which matches the fundamental frequency of a signal, for example: Pietsch et al (US 6118409), col. 3 lines 37-41 teaches matching an antenna to a signal); and

an adjustment line (fig. 7 directional coupler 13) connected between the filter and the antenna switch circuit,

but fails to teach the adjustment line adjusting properties at harmonic frequencies of the fundamental frequencies and the adjustment line preventing an impedance when the filter is seen from the connection point and an impedance when the antenna switch circuit is seen from the connection point from becoming complex conjugates of each other at the harmonic frequencies.

Yamazaki teaches the adjustment line (fig. 1 transmission line 105 & stubs 107 & 108) adjusting properties at harmonic frequencies of the fundamental frequencies (pg. 3 par. 0056) and

the adjustment line preventing an impedance when the filter is seen from the connection point and an impedance when the antenna switch circuit is seen from the connection point from becoming complex conjugates of each other at the harmonic frequencies (pg. 3 par. 0056, wherein it would have been obvious to one having ordinary skill in the art that suppressing the harmonics of the filter and the switch would negate the output impedance of the filter and the input impedance of the switch from becoming complex conjugates of each other at harmonic frequencies since it is known in the art that the suppression of harmonic frequencies will eliminate their effective impedances).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the generic directional coupler as taught by Ishizaki with the transmission line and stubs as taught by Yamazaki because it is obvious to substitute an art equivalent coupler such as taught in Yamazaki in the

place of the generic coupler structure shown in Ishizaki. Also, the stubs as disclosed in Yamazaki provide the benefit of suppressing unnecessary signals in a stop frequency (pg. 2 par. 0050).

Regarding claim 11, as an obvious consequence of modifying Ishizaki with Yamazaki such a combination further teaches a coupling line (fig. 1 transmission line 106) coupled with the adjustment line (fig. 1 transmission line 105 & stubs 107 & 108), wherein the coupling line and the adjustment line form part of a directional coupler (fig. 1 whole figure).

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al (US 20030076195) in view of Yamazaki et al (US 20020113666) as applied to claim 1 above, and further in view of Yu (US 20040005867).

Regarding claim 2, the combination of Ishizaki and Yamazaki teach all of the limitations as discussed above in claim 1, but the combination fails to teach a ground layer being divided into a ground layer for the filter and a ground layer for the antenna switch circuit.

Yu teaches a ground layer (fig. 2 ground connections "C-GND" "R-GND" & "T-GND") being divided into a ground layer (fig. 2 ground "T-GND") for the filter (fig.

2 transmission filter "Tx filter") and a ground layer (fig. 2 ground "C-GND") for the antenna switch circuit (fig. 2 switch 36, pg. 2 par. 0034).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the portable phone terminal as taught by the above combination with the divided ground section as taught by Yu because the divided ground section disclosed in Yu provides the benefit of minimizing the possibility of a radio frequency signal produced at the transmitter affecting the receiver (pg. 2 par. 0036).

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al (US 20030076195) in view of Yamazaki et al (US 20020113666) and Yu (US 20040005867) as applied to claim 2 above, and further in view of Tai et al (US 7027779).

Regarding claim 3, the combination of Ishizaki, Yamazaki, and Yu teach all of the elements as discussed above in claim 2, but the combination fails to teach the antenna switch module including a laminated body formed of a plurality of dielectric layers.

Tai teaches the antenna switch module (fig. 7 whole figure) including a laminated body formed of a plurality of dielectric layers (fig. 9, wherein the figure is the exploded view of fig. 7, col. 12 lines 6-10).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the generic antenna switch circuit as taught by the above combination as a laminated body antenna switch module as taught by Tai because the laminated body disclosed in Tai provides the benefit of reducing the size of the high-frequency switch module (col. 2 lines 26-30).

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al (US 20030076195) in view of Yamazaki et al (US 20020113666) as applied to claim 1 above, and further in view of Tai et al (US 7027779).

Regarding claim 7, the combination of Ishizaki and Yamazaki teach all of the limitations as discussed above in claim 1, but the combination fails to teach the antenna switch module including a laminated body formed of a plurality of dielectric layers.

Tai teaches the antenna switch module (fig. 7 whole figure) including a laminated body formed of a plurality of dielectric layers (fig. 9, wherein the figure is the exploded view of fig. 7, col. 12 lines 6-10).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the generic antenna switch circuit as taught by the above combination as a laminated body antenna switch module as taught by Tai

because the laminated body disclosed in Tai provides the benefit of reducing the size of the high-frequency switch module (col. 2 lines 26-30).

10. Claims 9 & 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al (US 20030076195) in view of Yamazaki et al (US 20020113666) as applied to claim 1 above, and further in view of Akiya (US 6236841).

Regarding claim 9, the combination of Ishizaki and Yamazaki teach all of the limitations as discussed above in claim 1, but the combination fails to teach the antenna switch circuit including an antenna switch element which is a PIN diode. Akiya teaches the antenna switch circuit (fig. 3 switching circuit 4) including an antenna switch element which is a PIN diode (col. 5 lines 30-32).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the switching circuit as taught by the above combination with the PIN diode as taught by Akiya because it is obvious to substitute an art equivalent switch such as taught in Akiya in the place of the generic switch structure shown in Ishizaki.

Regarding claim 10, the combination of Ishizaki and Yamazaki teach all of the limitations as discussed above in claim 1, but the combination fails to teach the

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antenna switch circuit including an antenna switch element which is a Gas switch.

Akiya teaches the antenna switch circuit (fig. 3 switching circuit 4) including an antenna switch element which is a GaAs switch (col. 5 lines 30-32).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the switching circuit as taught by the above combination with the GaAs switch as taught by Akiya because it is obvious to substitute an art equivalent switch such as taught in Akiya in the place of the generic switch structure shown in Ishizaki.

Allowable Subject Matter

11. Claims 4-6 & 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERALD STEVENS whose telephone number is

(571)270-5076. The examiner can normally be reached on Mon-Fri 7:30am - 5:00pm EST alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pascal Bob can be reached on 571-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/BENNY LEE/
PRIMARY EXAMINER
ART UNIT 2817**

GDS